



## SEQUENCE LISTING

<110> Johnson, Clayton H.  
McEwen, Joan E.

<120> Histoplasma capsulatum Chitin Synthase Sequences and Their Use  
for Detection of Histoplasma capsulatum and Histoplasmosis

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<140> US 10/718,955

<141> 2003-11-21

<150> US 60/428,135

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<223> Synthetic sequence

<400> 13

aaaagtcgac ccaactgcaa gtattgttac

30

<210> 14

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic sequence

<400> 14

aaaagtcgac tgatcaggat gtgctgtatc gcatcg

36

<210> 15

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic sequence

<400> 15

ctacctgtga tcccaacgag

20

<210> 16

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic sequence

<400> 16

acgccatcct ggtagattcc

20

<210> 17

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic sequence

<400> 17

aaggaattct ctagaccctt gtaacccaat gtc

33

<210> 18

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic sequence

<400> 18

aaggaaaaaa gcggccgcca aaacgagagg ctgggttg

38

<210> 19

<211> 37

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic sequence

<400> 19

aaggaaaaaa gcggccgcgc tgccgcttgg ccaactg

37

<210> 20

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic sequence

<400> 20

aagtctagag acccatctca gctcttc

27

<210> 21

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic sequence

<400> 21

tcgagcggcc gcgagttata ctgatgtctg

30

<210> 22

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic sequence

<400> 22

atctgcggcc gcattacctc taaacaagtg

30

<210> 23

<211> 905

<212> PRT

<213> Histoplasma capsulatum

<400> 23

Met Ala Tyr Pro Gly Ser Asn Ser Pro Gly Gly Tyr Gly Asp Gly His  
1 5 10 15

Arg Leu His Asp Leu Pro Ser Gly Ser Gln Tyr Asn Leu Pro Ala Glu  
20 25 30

His Asp Ala Ser Gln Ser Leu Leu His Gln Asn Gln Gly Pro Phe Ser  
35 40 45

Gly Pro Phe Asp Asp Pro Gln His His His Arg Gly Gly Ser Pro Val  
50 55 60

Arg Ser Pro Ser Arg Tyr Ser Leu Thr Glu Ser Tyr Val Thr Asp His  
65 70 75 80

Pro Gln Ala Gln Asp His Tyr Gly Gly Gln Met Glu Asn Pro Ala Ala  
85 90 95

Gly Phe Gly Val Pro Gly Arg Val Pro Ser Pro Tyr Thr Arg Ser Glu  
100 105 110

Thr Ser Ser Thr Glu Ala Trp Arg Gln Arg Gln Ala Pro Gly Asn Leu

115	120	125
Arg Arg Tyr Ala Thr Arg Lys Val Lys Leu Val Gln Gly Ser Val Leu		
130	135	140
Ser Val Asp Tyr Pro Val Pro Ser Ala Ile Gln Asn Ala Val Gln Ala		
145	150	155 160
Lys Tyr Arg Asn Asp Leu Glu Gly Gly Ser Glu Glu Phe Thr His Met		
	165	170 175
Arg Tyr Thr Ala Ala Thr Cys Asp Pro Asn Glu Phe Thr Leu His Asn		
	180	185 190
Gly Tyr Asn Leu Arg Pro Ala Met Tyr Asn Arg His Thr Glu Leu Leu		
	195	200 205
Ile Ala Ile Thr Tyr Tyr Asn Glu Asp Lys Met Leu Thr Ser Arg Thr		
	210	215 220
Leu His Gly Val Met Gln Asn Ile Arg Asp Ile Val Asn Leu Lys Lys		
225	230	235 240
Ser Glu Phe Trp Asn Lys Gly Gly Pro Ala Trp Gln Lys Ile Val Val		
	245	250 255
Cys Leu Val Phe Asp Gly Ile Asp Pro Cys Asp Lys Asp Thr Leu Asp		
	260	265 270
Val Leu Ala Thr Ile Gly Ile Tyr Gln Asp Gly Val Met Lys Lys Asp		
	275	280 285
Val Asp Gly Lys Glu Thr Ile Ala His Ile Phe Glu Tyr Thr Thr Gln		
	290	295 300
Leu Ser Val Thr Ala Asn Gln Gln Leu Ile Arg Pro His Asp Asp Gly		
305	310	315 320

Pro Ser Thr Leu Pro Pro Val Gln Met Met Phe Cys Leu Lys Gln Lys  
 325 330 335

Asn Ser Lys Lys Ile Asn Ser His Arg Trp Leu Phe Asn Ala Phe Gly  
 340 345 350

Arg Ile Leu Asn Pro Glu Ile Cys Ile Leu Leu Asp Ala Gly Thr Lys  
 355 360 365

Pro Gly His Lys Ser Leu Leu Ala Leu Trp Glu Ala Phe Tyr Asn Asp  
 370 375 380

Lys Asp Leu Gly Gly Ser Cys Gly Glu Ile His Ala Met Leu Gly Lys  
 385 390 395 400

Gly Trp Lys Asn Leu Ile Asn Pro Leu Val Ala Ala Gln Asn Phe Glu  
 405 410 415

Tyr Lys Ile Ser Asn Ile Leu Asp Lys Pro Leu Glu Ser Ser Phe Gly  
 420 425 430

Tyr Val Ser Val Leu Pro Gly Ala Phe Ser Ala Tyr Arg Phe Arg Ala  
 435 440 445

Ile Met Gly Arg Pro Leu Glu Gln Tyr Phe His Gly Asp His Thr Leu  
 450 455 460

Ser Lys Gln Leu Gly Pro Lys Gly Ile Glu Gly Met Asn Ile Phe Lys  
 465 470 475 480

Lys Asn Met Phe Leu Ala Glu Asp Arg Ile Leu Cys Phe Glu Leu Val  
 485 490 495

Ala Lys Ala Gly Ser Lys Trp His Leu Ser Tyr Val Lys Ser Ser Lys  
 500 505 510

Gly Glu Thr Asp Val Pro Glu Gly Ala Pro Glu Phe Ile Gly Gln Arg  
 515 520 525



Arg Arg Trp Leu Asn Gly Ser Phe Ala Ala Ser Ile Tyr Ser Leu Met  
 530 535 540

His Phe Gly Arg Met Tyr Lys Ser Gly His Asn Leu Leu Arg Met Phe  
 545 550 555 560

Phe Phe His Ile Gln Met Ile Tyr Asn Thr Cys Thr Val Ile Met Thr  
 565 570 575

Trp Phe Ala Leu Ala Ser Tyr Trp Leu Thr Thr Ser Val Ile Met Asp  
 580 585 590

Leu Val Gly Asn Pro Pro Ala Pro Glu Ser Gly Ser Thr Gln Arg Ala  
 595 600 605

Phe Pro Phe Gly Asn Thr Ala Thr Pro Ile Val Asn Thr Val Leu Lys  
 610 615 620

Tyr Leu Tyr Leu Ala Phe Leu Leu Leu Gln Phe Ile Leu Ala Leu Gly  
 625 630 635 640

Asn Arg Pro Lys Gly Ser Lys His Ser Tyr Ile Thr Ser Phe Val Val  
 645 650 655

Phe Gly Ile Ile Gln Leu Tyr Ile Ile Val Leu Ser Met Tyr Leu Val  
 660 665 670

Val Arg Ala Phe Ser Gly Gly Thr Leu Ala Phe Thr Thr Asp Lys Gly  
 675 680 685

Ile Gly Glu Phe Leu Lys Ser Phe Phe Ser Ser Glu Gly Pro Gly Ile  
 690 695 700

Ile Ile Ile Ala Leu Ala Ala Thr Phe Gly Leu Tyr Phe Val Ala Ser  
 705 710 715 720

Phe Met Tyr Leu Asp Pro Trp His Met Phe Thr Ser Phe Pro Ala Tyr  
 725 730 735

Leu Leu Ile Met Ser Ser Tyr Ile Asn Ile Leu Met Val Tyr Ala Phe  
                   740                  745                  750

Ser Asn Trp His Asp Val Ser Trp Gly Thr Lys Gly Ala Asp Lys Ala  
                   755                  760                  765

Asp Ala Leu Pro Ser Ala Gln Thr Gln Lys Glu Asp Asp Gly Lys Ala  
                   770                  775                  780

Ala Val Ile Glu Glu Ile Asp Lys Pro Gln Ala Asp Ile Asp Ser Gln  
                   785                  790                  795                  800

Phe Glu Ser Thr Val Lys Arg Ala Leu Thr Pro Tyr Val Glu Pro Lys  
                   805                  810                  815

Val Lys Glu Gly Lys Ser Leu Asp Asp Ser Tyr Lys Ser Phe Arg Thr  
                   820                  825                  830

Arg Leu Val Thr Leu Trp Leu Phe Ser Asn Gly Ile Leu Ala Val Ala  
                   835                  840                  845

Ile Thr Ser Glu Asp Val Asn Lys Phe Gly Phe Thr Ser Arg Ala Thr  
                   850                  855                  860

Ser Arg Thr Thr His Phe Phe His Ala Leu Leu Trp Ala Thr Ala Ala  
                   865                  870                  875                  880

Leu Ser Leu Ile Arg Phe Thr Gly Ala Cys Trp Phe Leu Gly Arg Thr  
                   885                  890                  895

Gly Ile Met Cys Cys Phe Ala Arg Arg  
                   900                  905

<210> 24

<211> 902

<212> PRT

<213> Coccidioides immitis

&lt;400&gt; 24

Met Ala Tyr Gln Gly Gly Gly Gly Asn Ser Pro Gly Gly Tyr Gly Asp  
 1 5 10 15

His Arg Leu Gln Asp Met Pro Ser Asn Gly Ser Gln Tyr His Leu Pro  
 20 25 30

Gln Asp Asp Asp Ala Ser Arg Ser Leu Leu Asn Gln Gly Pro Tyr Gly  
 35 40 45

Gly Pro Phe Asp Asp Pro His Gln Arg Thr Ala Ser Pro Ala Arg Pro  
 50 55 60

Ala Ser Arg Tyr Ser Leu Thr Glu Ser Tyr Ala Thr Asp Pro Gln Asn  
 65 70 75 80

Met Ser Gln Tyr Asn Asp Pro Met Tyr Gly Gln Gln Thr Asp Asn Pro  
 85 90 95

Ala Ala Gly Phe Gly Val Pro Gly Arg Val Ala Ser Pro Tyr Ser Arg  
 100 105 110

Ser Glu Thr Ser Ser Thr Asp Ala Trp Arg Arg Arg Gln Ala Pro Gln  
 115 120 125

Gly Asn Leu Arg Arg Tyr Ala Thr Arg Lys Val Lys Leu Val Gln Gly  
 130 135 140

Ser Val Leu Ser Val Asp Tyr Pro Val Pro Ser Ala Ile Gln Asn Ala  
 145 150 155 160

Val Gln Ala Lys Tyr Arg Asn Asp Leu Glu Gly Gly Ser Glu Glu Phe  
 165 170 175

Thr His Met Arg Tyr Thr Ala Ala Thr Cys Asp Pro Asn Asp Phe Thr  
 180 185 190

Leu His Asn Gly Tyr Asn Leu Pro Ala Met Tyr Asn Arg His Thr Glu

195	200	205
Leu Leu Ile Ala Ile Thr Tyr Tyr Asn Glu Asp Lys Met Leu Thr Ser		
210	215	220
Arg Thr Leu His Gly Val Met Gln Asn Ile Arg Asp Ile Val Asn Ile		
225	230	235 240
Lys Lys Ser Glu Phe Trp Asn Lys Gly Gly Pro Ala Trp Gln Lys Ile		
	245	250 255
Val Val Ala Leu Ile Phe Asp Gly Ile Asp Pro Cys Asp Lys Asp Val		
	260	265 270
Leu Asp Val Leu Ala Thr Ile Gly Val Tyr Gln Asp Gly Val Met Lys		
275	280	285
Arg Asp Val Asp Gly Lys Glu Thr Val Ala His Ile Phe Glu Tyr Thr		
290	295	300
Thr Gln Leu Ser Val Thr Ala Asn Gln Gln Leu Ile Arg Pro His Asp		
305	310	315 320
Asp Gly Pro Ser Thr Leu Pro Pro Val Gln Met Met Phe Cys Leu Lys		
	325	330 335
Gln Lys Asn Ser Lys Lys Ile Asn Ser His Arg Trp Leu Phe Asn Ala		
	340	345 350
Phe Gly Arg Ile Leu Asn Pro Glu Ile Cys Ile Leu Leu Asp Ala Gly		
	355	360 365
Thr Lys Pro Gly Ser Lys Ser Leu Leu Ala Leu Trp Glu Ala Phe Tyr		
370	375	380
Asn Asp Lys Asp Leu Gly Gly Ser Cys Gly Glu Ile His Ala Met Leu		
385	390	395 400

Gly Lys Gly Trp Thr Lys Leu Ile Asn Pro Leu Val Ala Ala Gln Asn  
405 410 415

Phe Glu Tyr Lys Ile Ser Asn Ile Leu Asp Lys Pro Leu Glu Ser Ser  
420 425 430

Phe Gly Tyr Val Ser Val Leu Pro Gly Ala Phe Ser Ala Tyr Arg Phe  
435 440 445

Arg Ala Ile Met Gly Arg Pro Leu Glu Gln Tyr Phe His Gly Asp His  
450 455 460

Thr Leu Ser Lys Gln Leu Gly Pro Lys Gly Ile Glu Gly Met Asn Ile  
465 470 475 480

Phe Lys Lys Asn Met Phe Leu Ala Glu Asp Arg Ile Leu Cys Phe Glu  
485 490 495

Leu Val Ala Lys Ala Gly Ser Lys Trp His Leu Thr Tyr Val Lys Ala  
500 505 510

Ser Lys Gly Glu Thr Asp Val Pro Glu Gly Ala Pro Glu Phe Ile Ser  
515 520 525

Gln Arg Arg Arg Trp Leu Asn Gly Ser Phe Ala Ala Ser Ile Tyr Ala  
530 535 540

Leu Met His Phe Gly Arg Met Tyr Lys Ser Gly His Asn Ile Leu Arg  
545 550 555 560

Met Phe Phe Phe His Ile Gln Met Leu Tyr Asn Thr Phe Thr Val Phe  
565 570 575

Leu Thr Trp Phe Ala Leu Ala Ala Tyr Trp Leu Thr Thr Ser Val Ile  
580 585 590

Met Asp Leu Val Gly Asn Pro Asn Gln Glu Gly Gln Arg Ala Phe Pro  
595 600 605

Phe Gly Asn Lys Val Thr Pro Ile Leu Asn Thr Val Leu Lys Tyr Leu  
 610 615 620

Tyr Leu Gly Phe Leu Leu Leu Gln Phe Ile Leu Ala Leu Gly Asn Arg  
 625 630 635 640

Pro Lys Gly Ser Lys His Ser Tyr Ile Thr Ser Phe Ile Leu Phe Gly  
 645 650 655

Leu Val Gln Leu Tyr Ile Val Ile Leu Ser Met Tyr Leu Val Val Arg  
 660 665 670

Ala Phe Ser Gly Ser Val Asp Phe Glu Thr Asp Lys Gly Val Asp Gly  
 675 680 685

Phe Leu Lys Ser Phe Phe Gly Ser Asp Ser Ala Gly Ile Ile Val Ile  
 690 695 700

Ala Leu Ala Ala Thr Phe Gly Leu Tyr Phe Val Ala Ser Phe Met Tyr  
 705 710 715 720

Met Asp Pro Trp His Met Phe Thr Ser Phe Pro Ala Tyr Leu Leu Ile  
 725 730 735

Met Ser Ser Tyr Ile Asn Ile Leu Met Val Tyr Ala Phe Ser Asn Trp  
 740 745 750

His Asp Val Ser Trp Gly Thr Lys Gly Ser Asp Lys Ala Asp Ala Leu  
 755 760 765

Pro Ser Ala Gln Thr Thr Lys Glu Asp Gly Gly Lys Ala Ala Val Ile  
 770 775 780

Glu Glu Ile Asp Lys Pro Gln Ala Asp Ile Asp Ser Gln Phe Glu Ala  
 785 790 795 800

Thr Val Lys Arg Ala Leu Thr Pro Phe Val Glu Pro Lys Val Asp Glu  
 805 810 815

Lys Lys Ser Leu Glu Asp Ser Tyr Lys Ser Phe Arg Thr Arg Leu Val  
                   820                  825                  830

Ala Ser Trp Ile Phe Ser Asn Ala Leu Leu Ala Val Leu Ile Thr Ser  
           835                  840                  845

Asp Ser Val Asn Lys Leu Gly Phe Thr Ser Gln Ala Thr Asp Arg Thr  
       850                  855                  860

Ala Asn Phe Phe Arg Ala Leu Leu Trp Ala Thr Ala Ala Leu Ser Leu  
 865                  870                  875                  880

Ile Arg Phe Ile Gly Ala Cys Trp Phe Leu Gly Lys Ser Gly Ile Met  
                   885                  890                  895

Cys Cys Phe Ala Arg Arg  
           900

<210> 25

<211> 911

<212> PRT

<213> Aspergillus fumigatus

<400> 25

Met Ala Tyr Gln Gly Ser Gly Ser His Ser Pro Pro His Tyr Asp Asp  
   1                  5                  10                  15

Asn Gly His Arg Leu Gln Asp Leu Pro His Gly Ser Tyr Glu Glu Glu  
           20                  25                  30

Ala Ser Arg Gly Leu Leu Ser His Gln Gln Gly Pro Phe Thr Gly Pro  
       35                  40                  45

Phe Asp Asp Pro Gln Gln His Gly Ser Ser Thr Thr Arg Pro Val Ser  
       50                  55                  60

Gly Tyr Ser Leu Ser Glu Thr Tyr Ala Pro Glu Ala Ala Tyr His Asp  
 65                  70                  75                  80

Pro Tyr Thr Gln Pro Ser Pro Gly Ser Val Tyr Ser Ala Gln Ser Ala  
85 90 95

Glu Asn Pro Ala Ala Ala Phe Gly Val Pro Gly Arg Val Ala Ser Pro  
100 105 110

Tyr Ala Arg Ser Asp Thr Ser Ser Thr Glu Ala Trp Arg Gln Arg Gln  
115 120 125

Ala Pro Gly Gly Gly Pro Gly Gly Leu Arg Arg Tyr Ala Thr Arg Lys  
130 135 140

Val Lys Leu Val Gln Gly Ser Val Leu Ser Val Asp Tyr Pro Val Pro  
145 150 155 160

Ser Ala Ile Gln Asn Ala Ile Gln Ala Lys Tyr Arg Asn Asp Leu Glu  
165 170 175

Gly Gly Ser Glu Glu Phe Thr His Met Arg Tyr Thr Ala Ala Thr Cys  
180 185 190

Asp Pro Asn Glu Phe Thr Leu His Asn Gly Tyr Asn Leu Arg Pro Ala  
195 200 205

Met Tyr Asn Arg His Thr Glu Leu Leu Ile Ala Ile Thr Tyr Tyr Asn  
210 215 220

Glu Asp Lys Thr Leu Thr Ser Arg Thr Leu His Gly Val Met Gln Asn  
225 230 235 240

Ile Arg Asp Ile Val Asn Leu Lys Lys Ser Glu Phe Trp Asn Lys Gly  
245 250 255

Gly Pro Ala Trp Gln Lys Ile Val Val Cys Leu Val Phe Asp Gly Ile  
260 265 270

Asp Pro Cys Asp Lys Asp Thr Leu Asp Val Leu Ala Thr Ile Gly Val



275							280									285
Tyr	Gln	Asp	Gly	Val	Met	Lys	Arg	Asp	Val	Asp	Gly	Lys	Glu	Thr	Val	
290						295					300					
Ala	His	Ile	Phe	Glu	Tyr	Thr	Thr	Gln	Leu	Ser	Val	Thr	Pro	Asn	Gln	
305					310					315					320	
Gln	Leu	Ile	Arg	Pro	Thr	Asp	Asp	Gly	Pro	Ser	Thr	Leu	Pro	Pro	Val	
				325					330					335		
Gln	Met	Met	Phe	Cys	Leu	Lys	Gln	Lys	Asn	Ser	Lys	Lys	Ile	Asn	Ser	
			340					345					350			
His	Arg	Trp	Leu	Phe	Asn	Ala	Phe	Gly	Arg	Ile	Leu	Asn	Pro	Glu	Val	
	355						360					365				
Cys	Ile	Leu	Leu	Asp	Ala	Gly	Thr	Lys	Pro	Gly	Pro	Lys	Ser	Leu	Leu	
370						375					380					
Ser	Leu	Trp	Glu	Ala	Phe	Tyr	Asn	Asp	Lys	Asp	Leu	Gly	Gly	Ala	Cys	
385					390					395					400	
Gly	Glu	Ile	His	Ala	Met	Leu	Gly	Lys	Gly	Trp	Lys	Asn	Leu	Ile	Asn	
				405					410					415		
Pro	Leu	Val	Ala	Ala	Gln	Asn	Phe	Glu	Tyr	Lys	Ile	Ser	Asn	Ile	Leu	
			420					425					430			
Asp	Lys	Pro	Leu	Glu	Ser	Ser	Phe	Gly	Tyr	Val	Ser	Val	Leu	Pro	Gly	
	435						440					445				
Ala	Phe	Ser	Ala	Tyr	Arg	Phe	Arg	Ala	Ile	Met	Gly	Arg	Pro	Leu	Glu	
450						455					460					
Gln	Tyr	Phe	His	Gly	Asp	His	Thr	Leu	Ser	Lys	Gln	Leu	Gly	Lys	Lys	
465					470					475					480	

Gly Ile Glu Gly Met Asn Ile Phe Lys Lys Asn Met Phe Leu Ala Glu  
                   485                  490                  495

Asp Arg Ile Leu Cys Phe Glu Leu Val Ala Lys Ala Gly Ser Lys Trp  
                   500                  505                  510

His Leu Thr Tyr Val Lys Ala Ser Lys Ala Glu Thr Asp Val Pro Glu  
                   515                  520                  525

Gly Ala Pro Glu Phe Ile Ser Gln Arg Arg Arg Trp Leu Asn Gly Ser  
                   530                  535                  540

Phe Ala Ala Gly Ile Tyr Ser Leu Met His Phe Gly Arg Met Tyr Lys  
 545                  550                  555                  560

Ser Gly His Asn Ile Val Arg Met Phe Phe Leu His Ile Gln Met Leu  
                   565                  570                  575

Tyr Asn Ile Phe Ser Thr Val Leu Thr Trp Phe Ser Leu Ala Ser Tyr  
                   580                  585                  590

Trp Leu Thr Thr Thr Val Ile Met Asp Leu Val Gly Thr Pro Ser Asp  
                   595                  600                  605

Asn Asn Gly Asn Lys Ala Phe Pro Phe Gly Lys Thr Ala Thr Pro Ile  
                   610                  615                  620

Ile Asn Thr Ile Val Lys Tyr Val Tyr Leu Gly Phe Leu Leu Leu Gln  
 625                  630                  635                  640

Phe Ile Leu Ala Leu Gly Asn Arg Pro Lys Gly Ser Lys Phe Ser Tyr  
                   645                  650                  655

Leu Ala Ser Phe Val Val Phe Gly Ile Ile Gln Val Tyr Val Val Ile  
                   660                  665                  670

Asp Ala Leu Tyr Leu Val Val Arg Ala Phe Ser Gly Ser Ala Pro Met  
                   675                  680                  685

Asp Phe Thr Thr Asp Gln Gly Val Gly Glu Phe Leu Lys Ser Phe Phe  
 690 695 700

Ser Ser Ser Gly Ala Gly Ile Ile Ile Ile Ala Leu Ala Ala Thr Phe  
 705 710 715 720

Gly Leu Tyr Phe Val Ala Ser Phe Met Tyr Leu Asp Pro Trp His Met  
 725 730 735

Phe Thr Ser Phe Pro Ala Tyr Met Cys Val Gln Ser Ser Tyr Ile Asn  
 740 745 750

Ile Leu Asn Val Tyr Ala Phe Ser Asn Trp His Asp Val Ser Trp Gly  
 755 760 765

Thr Lys Gly Ser Asp Lys Ala Asp Ala Leu Pro Ser Ala Lys Thr Thr  
 770 775 780

Lys Asp Glu Gly Lys Glu Val Val Ile Glu Glu Ile Asp Lys Pro Gln  
 785 790 795 800

Ala Asp Ile Asp Ser Gln Phe Glu Ala Thr Val Lys Arg Ala Leu Thr  
 805 810 815

Pro Tyr Val Pro Pro Val Glu Lys Glu Glu Lys Thr Leu Glu Asp Ser  
 820 825 830

Tyr Lys Ser Phe Arg Thr Arg Leu Val Thr Phe Trp Ile Phe Ser Asn  
 835 840 845

Ala Phe Leu Ala Val Cys Ile Thr Ser Asp Gly Val Asp Lys Phe Gly  
 850 855 860

Phe Thr Asn Ser Ala Thr Asp Arg Thr Gln Arg Phe Phe Gln Ala Leu  
 865 870 875 880

Leu Trp Ser Asn Ala Val Val Ala Leu Phe Arg Phe Ile Gly Ala Cys  
 885 890 895

Trp Phe Leu Gly Lys Thr Gly Leu Met Cys Cys Phe Ala Arg Arg  
 { 900 905 910

<210> 26

<211> 916

<212> PRT

<213> Aspergillus nidulans

<400> 26

Met Ala Tyr His Gly Ser Gly Pro Gln Ser Pro Gly Glu His Thr Tyr  
 1 5 10 15

Asp Asp Gly His Gln Leu Arg Asp Leu Ser His Ser Asn Thr Ser Tyr  
 20 25 30

Glu Glu Glu Ala Ser His Gly Leu Leu Ser Ser Gln Gln Ser Pro Phe  
 35 40 45

Ala Gly Pro Phe Asp Asp Pro His Gln Gln Arg Gly Leu Thr Ala Ser  
 50 55 60

Pro Val Gln Arg Pro Thr Ser Gly Tyr Ser Leu Thr Glu Ser Tyr Ala  
 65 70 75 80

Pro Asp Ala Ala Tyr His Asp Pro Tyr Ser Ala Asn Gln Ser Val Tyr  
 85 90 95

Ser Gly His Ser Glu Asn Pro Ala Ala Ala Phe Gly Val Pro Gly Arg  
 100 105 110

Val Ala Ser Pro Tyr Ala Arg Ser Glu Thr Ser Ser Thr Glu Ala Trp  
 115 120 125

Arg Gln Arg Gln Ala Gly Ala Arg Arg Gly Gly Asn Gly Leu Arg Arg  
 130 135 140

Tyr Ala Thr Arg Lys Val Lys Leu Val Gln Gly Ser Val Leu Ser Val  
 145 150 155 160

Asp Tyr Pro Val Pro Ser Ala Ile Gln Asn Ala Ile Gln Ala Lys Tyr  
                           165                          170                          175

Arg Asn Asp Leu Glu Gly Gly Ser Glu Glu Phe Thr His Met Arg Tyr  
                           180                          185                          190

Thr Ala Ala Thr Cys Asp Pro Asn Glu Phe Thr Leu His Asn Gly Tyr  
                           195                          200                          205

Asn Leu Arg Pro Ala Met Tyr Asn Arg His Thr Glu Leu Leu Ile Ala  
                           210                          215                          220

Ile Thr Tyr Tyr Asn Glu Asp Lys Thr Leu Thr Ala Arg Thr Leu His  
                           225                          230                          235                          240

Gly Val Met Gln Asn Ile Arg Asp Ile Val Asn Leu Lys Lys Ser Glu  
                           245                          250                          255

Phe Trp Asn Lys Gly Gly Pro Ala Trp Gln Lys Ile Val Val Cys Leu  
                           260                          265                          270

Val Phe Asp Gly Ile Asp Pro Cys Asp Lys Asp Thr Leu Asp Val Leu  
                           275                          280                          285

Ala Thr Val Gly Ile Tyr Gln Asp Gly Val Met Lys Arg Asp Val Asp  
                           290                          295                          300

Gly Lys Glu Thr Val Ala His Ile Phe Glu Tyr Thr Thr Gln Leu Ser  
                           305                          310                          315                          320

Val Thr Pro Asn Gln Gln Leu Ile Arg Pro Thr Asp Asp Gly Pro Ser  
                           325                          330                          335

Thr Leu Pro Pro Val Gln Met Met Phe Cys Leu Lys Gln Lys Asn Ser  
                           340                          345                          350

Lys Lys Ile Asn Ser His Arg Trp Leu Phe Asn Ala Phe Gly Arg Ile

355		360		365
Leu Asn Pro Glu Val Cys Ile Leu Leu Asp Ala Gly Thr Lys Pro Gly				
370		375		380
Pro Lys Ser Leu Leu Tyr Leu Trp Glu Ala Phe Tyr Asn Asp Lys Asp				
385		390		395 400
Leu Gly Gly Ala Cys Gly Glu Ile His Ala Met Leu Gly Lys Gly Trp				
	405		410	415
Lys Lys Leu Leu Asn Pro Leu Val Ala Ala Gln Asn Phe Glu Tyr Lys				
	420		425	430
Ile Ser Asn Ile Leu Asp Lys Pro Leu Glu Ser Ser Phe Gly Tyr Val				
	435		440	445
Ser Val Leu Pro Gly Ala Phe Ser Ala Tyr Arg Phe Arg Ala Ile Met				
	450		455	460
Gly Arg Pro Leu Glu Gln Tyr Phe His Gly Asp His Thr Leu Ser Lys				
465		470		475 480
Gln Leu Gly Lys Lys Gly Ile Glu Gly Met Asn Ile Phe Lys Lys Asn				
	485		490	495
Met Phe Leu Ala Glu Asp Arg Ile Leu Cys Phe Glu Leu Val Ala Lys				
	500		505	510
Ala Gly Ser Lys Trp His Leu Ser Tyr Val Lys Ala Ser Lys Gly Glu				
	515		520	525
Thr Asp Val Pro Glu Gly Ala Pro Glu Phe Ile Ser Gln Arg Arg Arg				
	530		535	540
Trp Leu Asn Gly Ser Phe Ala Ala Gly Ile Tyr Ser Leu Met His Phe				
545		550		555 560

Gly Arg Met Tyr Lys Ser Gly His Asn Ile Val Arg Met Phe Phe Leu  
565 570 575

His Leu Gln Met Leu Tyr Asn Trp Phe Ser Thr Phe Leu Thr Trp Phe  
580 585 590

Ser Leu Ala Ser Tyr Trp Leu Thr Thr Ser Val Ile Met Asp Leu Val  
595 600 605

Gly Thr Pro Ser Ser Ser Asn Gly Tyr Thr Ala Phe Pro Phe Gly Lys  
610 615 620

Thr Ala Thr Pro Ile Ile Asn Thr Leu Val Lys Tyr Ile Tyr Leu Ala  
625 630 635 640

Phe Leu Leu Leu Gln Phe Ile Leu Ala Leu Gly Asn Arg Pro Lys Gly  
645 650 655

Ser Lys Leu Ser Tyr Leu Ala Ser Phe Val Ala Phe Gly Ile Ile Gln  
660 665 670

Leu Tyr Val Val Val Asp Ala Leu Tyr Leu Val Val Arg Ala Phe Thr  
675 680 685

Gly Gly Ala Pro Met Asp Phe Asn Thr Asp Asp Gly Ile Gly Ala Phe  
690 695 700

Leu Ser Ser Phe Phe Gly Ser Ser Gly Ala Gly Ile Ile Ile Ile Ala  
705 710 715 720

Leu Ala Ala Thr Phe Gly Leu Tyr Phe Val Ala Ser Phe Met Tyr Leu  
725 730 735

Asp Pro Trp His Met Phe Thr Ser Phe Pro Ala Tyr Met Ala Val Gln  
740 745 750

Ser Ser Tyr Ile Asn Ile Leu Asn Val Tyr Ala Phe Ser Asn Trp His  
755 760 765

Asp Val Ser Trp Gly Thr Lys Gly Ser Asp Lys Ala Asp Ala Leu Pro  
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Ser Ala Lys Thr Thr Gly Gly Lys Gly Glu Glu Ala Val Ile Glu Glu  
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Ile Asp Lys Pro Gln Ala Asp Ile Asp Ser Gln Phe Glu Ala Thr Val  
 805 810 815

Lys Arg Ala Leu Thr Pro Tyr Val Pro Pro Glu Glu Lys Glu Glu Lys  
 820 825 830

Ser Leu Asp Asp Ser Tyr Lys Ser Phe Arg Thr Arg Leu Val Thr Leu  
 835 840 845

Trp Leu Phe Ser Asn Gly Leu Leu Ala Val Cys Ile Thr Ser Glu Gly  
 850 855 860

Leu Asp Lys Phe Gly Phe Thr Asn Thr Ser Thr Glu Arg Thr Ser Arg  
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Phe Phe Gln Ala Leu Leu Trp Ser Asn Ala Val Val Ala Leu Ile Arg  
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Xaa Leu Pro Xaa Xaa Xaa Xaa Ala Ser Arg Ser Leu Leu Xaa Xaa Xaa  
 35 40 45

Gln Gly Pro Xaa Xaa Gly Pro Phe Asp Asp Pro Gln Xaa His Xaa Xaa  
 50 55 60

Xaa Arg Gly Xaa Ser Pro Xaa Arg Pro Xaa Ser Arg Tyr Ser Leu Thr  
 65 70 75 80

Glu Ser Tyr Ala Thr Xaa Xaa Xaa Xaa Xaa Xaa Xaa Tyr Xaa Xaa Pro  
 85 90 95

Xaa Xaa Xaa Xaa Xaa Tyr Gly Gly Gln Xaa Xaa Xaa Asn Pro Ala Ala  
 100 105 110

Gly Phe Gly Val Pro Gly Arg Val Ala Ser Pro Tyr Xaa Arg Ser Xaa  
 115 120 125

Thr Ser Ser Thr Xaa Ala Trp Arg Gln Arg Gln Ala Pro Xaa Xaa Xaa  
 130 135 140

Xaa Xaa Gly Asn Leu Arg Arg Tyr Ala Thr Arg Lys Val Lys Leu Val  
 145 150 155 160

Gln Gly Ser Val Leu Ser Val Asp Tyr Pro Val Pro Ser Ala Ile Gln  
 165 170 175

Asn Ala Xaa Gln Ala Lys Tyr Arg Asn Asp Leu Glu Gly Gly Ser Glu  
 180 185 190

Glu Phe Thr His Met Arg Tyr Thr Ala Ala Thr Cys Asp Pro Asn Xaa  
 195 200 205

Phe Thr Leu His Asn Gly Tyr Asn Leu Arg Pro Ala Met Tyr Asn Arg  
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His Thr Glu Leu Leu Ile Ala Ile Thr Tyr Tyr Asn Glu Asp Lys Met  
 225 230 235 240

Leu Thr Ser Arg Thr Leu His Gly Val Met Gln Asn Ile Arg Asp Ile  
 245 250 255

Val Asn Leu Lys Lys Ser Glu Phe Trp Asn Lys Gly Gly Pro Ala Trp  
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Gln Lys Ile Val Val Cys Leu Xaa Phe Asp Gly Ile Asp Pro Cys Asp  
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Lys Asp Thr Leu Asp Val Leu Ala Thr Xaa Gly Xaa Tyr Gln Asp Gly  
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Val Met Lys Arg Asp Val Asp Gly Lys Glu Thr Xaa Ala His Ile Phe  
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Glu Tyr Thr Thr Gln Leu Ser Val Thr Ala Asn Gln Gln Leu Ile Arg  
 325 330 335

Pro His Asp Asp Gly Pro Ser Thr Leu Pro Pro Val Gln Met Met Phe  
 340 345 350

Cys Leu Lys Gln Lys Asn Ser Lys Lys Ile Asn Ser His Arg Trp Leu  
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Phe Asn Ala Phe Gly Arg Ile Leu Asn Pro Glu Xaa Cys Ile Leu Leu  
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Asp Ala Gly Thr Lys Pro Gly Xaa Lys Ser Leu Leu Ala Leu Trp Glu  
 385 390 395 400

Ala Phe Tyr Asn Asp Lys Asp Leu Gly Gly Ser Cys Gly Glu Ile His  
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Ala Met Leu Gly Lys Gly Trp Lys Asn Leu Ile Asn Pro Leu Val Ala  
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Ala Gln Asn Phe Glu Tyr Lys Ile Ser Asn Ile Leu Asp Lys Pro Leu  
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Glu Ser Ser Phe Gly Tyr Val Ser Val Leu Pro Gly Ala Phe Ser Ala  
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Tyr Arg Phe Arg Ala Ile Met Gly Arg Pro Leu Glu Gln Tyr Phe His  
 465 470 475 480

Gly Asp His Thr Leu Ser Lys Gln Leu Gly Pro Lys Gly Ile Glu Gly  
 485 490 495

Met Asn Ile Phe Lys Lys Asn Met Phe Leu Ala Glu Asp Arg Ile Leu  
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Cys Phe Glu Leu Val Ala Lys Ala Gly Ser Lys Trp His Leu Ser Tyr  
 515 520 525

Val Lys Ala Ser Lys Gly Glu Thr Asp Val Pro Glu Gly Ala Pro Glu  
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Phe Ile Ser Gln Arg Arg Arg Trp Leu Asn Gly Ser Phe Ala Ala Ser  
 545 550 555 560

Ile Tyr Ser Leu Met His Phe Gly Arg Met Tyr Lys Ser Gly His Asn  
 565 570 575

Ile Leu Arg Met Phe Phe Phe His Ile Gln Met Leu Tyr Asn Thr Phe  
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Thr Val Phe Xaa Thr Trp Phe Ala Leu Ala Ser Tyr Trp Leu Thr Thr  
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Ser Val Ile Met Asp Leu Val Gly Asn Pro Xaa Xaa Xaa Xaa Ser Xaa  
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Xaa Gly Gln Arg Ala Phe Pro Phe Gly Asn Thr Ala Thr Pro Ile Xaa  
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Asn Thr Val Leu Lys Tyr Leu Tyr Leu Ala Phe Leu Leu Leu Gln Phe  
 645 650 655

Ile Leu Ala Leu Gly Asn Arg Pro Lys Gly Ser Lys His Ser Tyr Ile  
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Thr Ser Phe Xaa Val Phe Gly Ile Xaa Gln Leu Tyr Xaa Xaa Xaa Leu  
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Ser Xaa Gly Leu Val Val Arg Ala Phe Ser Gly Gly Xaa Xaa Xaa Asp  
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Phe Thr Thr Asp Lys Gly Xaa Gly Glu Phe Leu Lys Ser Phe Phe Gly  
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Ser Xaa Gly Ala Gly Ile Ile Xaa Ile Ala Leu Ala Ala Thr Phe Gly  
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Leu Tyr Phe Val Ala Ser Phe Met Tyr Xaa Asp Pro Trp His Met Phe  
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Thr Ser Phe Pro Ala Tyr Xaa Leu Xaa Met Ser Ser Tyr Ile Asn Ile  
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Leu Met Val Tyr Ala Phe Ser Asn Trp His Asp Val Ser Trp Gly Thr  
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Lys Gly Ser Asp Lys Ala Asp Ala Leu Pro Ser Ala Gln Thr Thr Lys

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Ala Asp Ile Asp Ser Gln Phe Glu Ala Thr Val Lys Arg Ala Leu Thr						
		820		825		830
Pro Xaa Val Glu Pro Lys Val Lys Glu Xaa Lys Ser Leu Xaa Asp Ser						
		835		840		845
Tyr Lys Ser Phe Arg Thr Arg Leu Val Thr Leu Trp Ile Phe Ser Asn						
		850		855		860
Ala Leu Leu Ala Val Xaa Ile Thr Ser Xaa Xaa Val Xaa Lys Phe Gly						
865		870		875		880
Phe Thr Ser Xaa Ala Thr Asp Arg Thr Xaa Xaa Phe Phe Xaa Ala Leu						
		885		890		895
Leu Trp Ala Thr Ala Ala Leu Ser Leu Ile Arg Phe Ile Gly Ala Cys						
		900		905		910
Trp Phe Leu Gly Lys Thr Gly Ile Xaa Cys Cys Phe Ala Arg Arg						
		915		920		925